

COUNTRY Hungary

REPORT NO.

TOPIC Radio Circuits and Radio Equipment in Use with the Hungarian Armed Forces

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REFERENCES

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REMARKS

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the essential data contained in the MTR-III manual on military radio operations. This manual was issued in 1950 by the Signal Division of the Hungarian Ministry of National Defense as classified military information. (1)

2. Permanent radio nets maintained by the Hungarian military establishment included:

- a. A command radio net of the Chief of Staff of the Hungarian Army with lines to the 38th AAA Div in Budapest and a signal unit in Vác (Q 48/H 65);
- b. A command radio net of the 38th AAA Div with lines to the AAA regiments in Székesfehérvár (Q 48/Z 00), Vác, Dunafeleldvár (Y 6/E 35) and Szolnok (Q 48/O 37);
- c. A command radio net of the tank corps in Budapest with lines to the tank divisions in Esztergom (Q 48/Z 27) and Gyöngyös (Q 48/J 24) and a tank unit in Pétervársz (Q 49/J 37);
- d. An alert radio net of the Chief of Staff of the Hungarian Army, to which were linked all units directly assigned to the General Staff, including the 38th AAA Div. All these units permanently kept a radio receiver tuned in to the alert wave, which, in 1951, was fixed at 3,880 k.c.p.s.

25X1 3. a description and sketches of all the radio receivers and transmitters of the Hungarian Army. The technical data of these 25X1 sets were included in a tabulation. Except for the RBM-1 type equipment delivered by the Russians, all the sets described were manufactured by the Standard Works in Budapest. (2)

25X1A 4. a. The R/3 type radio receiver and transmitter was already in use with the former Hungarian Army. It is used by infantry regiments and battalions as well as by artillery regiments, battalions and batteries for fire control purposes. This set, which can be used also during a march, is very

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popular with troop units because of its sturdy construction and its great shock resistance. However, because of its heavy weight it is scheduled to be replaced by the R/20 set. For this reason, only those R/3 type sets were accepted for repair whose guaranteed life had not lapsed. All the other sets had to be turned in to the Central Signal Depot in case of damage.

- b. The RBH-1 type radio receiver and transmitter is Soviet equipment with inscriptions in Cyrillic letters and is to be repaired only at the Central Signal Depot. Under combat conditions, the set is carried sideways by means of a strap, while the accessory box which also contains the dry cell, is carried on the back. The set is coupled either with a telephone handset fitted with a press-to-talk switch or a double headphone and a throat microphone which is also called a gas microphone.
- c. The R/20 type radio receiver and transmitter is the Hungarian version of the RBH-1 type set. The 38th AAA Div received the first sets of this type in July 1951. This set is carried by two men. [redacted] 25X1
[redacted] troop units are not satisfied with this equipment. Its tubes are so sensitive that two or three of them must usually be replaced after a prolonged exercise. At night, these sets suffer from too little selectivity.
- d. The R/5B type set, which was in use in the former Hungarian Army, usually in tanks, [redacted] 25X1
[redacted] The set is operated by four men.
- e. The A/5B radiophone also dates back to pre-war times. Only a few of these sets were still in use. The set may be used either as a standard telephone set for wire connections or as a radiophone for distances of up to 3 km. An improved version of the set has the type designation A/7B.
- f. The R/7L type radio receiver and transmitter was in use with the former Hungarian Army. [redacted] 25X1
The set, which was believed to be obsolete because of its excessive weight, was assigned a crew of one NCO and seven men. During operations, the generator of the set is served by one radio operator and one man. (3)
- g. The R/7B radio receiver and transmitter is built in quantity at the Standard Works. This modern set is very reliable, but its assembly and disassembly requires too much time, and its steel batteries have only a limited capacity. The set is worked by a crew of one NCO and seven men. Generally, the set is loaded on vehicles for transportation, but it can be handcarried.
- h. [redacted] a R/14 type 100 watt transmitter weighed 650 kg. (4)
- i. The R/41 type radio receiver was tuned to the alert wave at the Hq 38th AAA Div.

5. [redacted] the R/39 type portable switchboards used by the Hungarian Armed Forces were to be replaced by small ten-digit dials switch exchanges. These switchboards make it impossible for switchboard personnel to monitor talks conducted over the line. A humming sound is produced at the two telephone sets in case the switchboard operator listens in.

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 Comments.

- (1) For a summary of the HIR-III manual, see Annex 1. This summary gives a fairly good picture of Hungarian military radio procedure and also contains indications as to basic tactical concepts underlying this procedure. The concept that wire communication is unsuitable for mobile warfare is definitely wrong. With adequate equipment and an intelligent employment, wire connections may be established to the main points of effort even in mobile warfare. The decision as to radio silence or employment of radio communications is not up to the signal officer but to the commander of troops.
- (2) For a tabulation of technical data for radio equipment used by the Hungarian Army, see Annex 2. The Standard Electrical Engineering Works are believed to be located on Fehérvári Street, Budapest XI.
- (3) Electric power is supplied for this set by a bicycle-like device, which offers the advantage that the set does not depend for its power supply on engines or batteries. Its drawback is the need for additional personnel.
- (4) All the radio equipment in use with the Hungarian Armed Forces appears to be unusually heavy.

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Summary of the HR-III Manual.General.

1. In mobile warfare, radio is the most important means of communication, as wire communication is not practicable for this type of operation. In defensive warfare, radio communication is the exception. Radio silence prevails, while radio receivers are ready for reception. The individual radio stations report at pre-arranged times.

Classification of Radio Sets.

2. Radio equipment available includes:
 - a. Small portable sets with an output of up to 5 Watts which are almost exclusively used for radiotelephony, reconnaissance and fire control purposes.
 - b. Light portable sets with an output of 5 to 20 Watts, suitable for radiotelephony and cw transmission.
 - c. Medium sets with an output of 20 to 100 Watts.
 - d. Heavy sets with an output of upward of 100 Watts. These sets are generally mounted on trucks, designed for cw operations and at the disposal of high-echelon command headquarters.

Classification of Radio Links.

3. With regard to tactical employment, radio links are differentiated as follows:
 - a. Radio links of commanders used for the conduct of operations.
 - b. Radio links used for fire control purposes.
 - c. Radio links established between forward observation posts or air observers and the commander concerned.
 - d. Alert radio links established between higher command headquarters. Each of the assigned units has one radio receiver permanently tuned in to the wave used for this radio net.
 - e. Radio links for communications between high-echelon army or air force command headquarters.
 - f. Radio installations used for propaganda transmissions.

Classification of Radio Messages.

4. Radio messages are classified as follows:
 - a. Radio messages of varying urgency transmitted in code by command headquarters.
 - b. Alert messages giving warning of unexpected tank attacks, air raids or gas attacks. If possible, these messages are to be transmitted in code. In favorable atmospheric conditions they will be transmitted once; under adverse receiving conditions they must be transmitted until acknowledgement of receipt.

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- c. Exchange of messages relative to the conduct of communication and including test contacts. This traffic is also conducted in code.
- d. So-called circular messages transmitted by the net control station to all stations of the net. A special call signal announces the transmission of such a message. As a rule, the reception of these messages is acknowledged by telephone or teletype.

Types of Radio Traffic.

5. Radio traffic is conducted as follows:

- a. Line traffic, i.e. two-station radio communication.
- b. Star traffic, i.e. radio net traffic between a net control station and two or six stations, which do not communicate with each other. Star traffic is maintained between division or regimental headquarters and their assigned units.
- c. Combined star traffic, which essentially follows the same procedure as star traffic, except for the fact that individual stations may communicate with their neighbors. Combined star traffic is conducted by large units.
- d. Net traffic includes up to four stations communicating at will on the frequency of their called station. The traffic is monitored by the net control station.

Security Measures.

- 6. Besides operators, only the commanding officer, the political officer, the signal officer, and in case of headquarters, the commander of the headquarters company, have access to radio installations. The chief of the radio station concerned is responsible for the conduct of radio operations. The officers mentioned must not operate radio sets. Operators are held to monitor the passages of commanding officers and to switch off the transmitter, if names in clear text are used. All papers and documents of the radio station must either be destroyed or kept in a linen bag. If the station is threatened by advancing enemy troops all documents and the radio equipment must be destroyed.

Conduct of Radio Operations.

- 7. The radio net of a unit is established by the signal officer concerned, according to specifications given by the commander. Radio links are established in the following sequence:
 - a. Connection to assigned units.
 - b. Connection to forward observation posts.
 - c. Connection to the right neighbor.
 - d. Connection to headquarters in the rear zone.

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8. Radio procedure including call signals to be used is laid down by the signal officer of the unit concerned on the basis of orders which he generally receives from the signal officer of the army. From the radio code tables available and by means of a special number assigned to the radio station, the signal officer determines the call signal which consists of three letters and a three-unit letter and number combination. The signal officer prepares for each of his radio stations written orders which must include the following data:
- Time period during which the radio procedure will be in force; for the present, generally 4 to 5 days; in time of war only 24 hours.
 - Type of connection to be established, i.e. either line or net traffic.
 - Continuous frequency, operating frequency, reserve frequency in addition to two or three alternate frequencies and call signals assigned to these frequencies. The station will use the operating frequency ordered; in case of technical disturbances, it will switch over to the reserve frequency. After the lapse of the time period laid down for a specific radio procedure, radio stations will use the continuous frequency. Communications with changing frequencies are conducted only by important radio stations in such a way that after the transmission of 10 groups of ciphers each, the station will switch over from the operating to the reserve frequency, and then to the allotted alternate frequencies.
 - Call signals for star traffic.
 - A frequency to be used for the transmission of call signals.
 - Information required for the handling of the encoding and decoding chart.
 - The date when the order concerning radio procedure was made out and the signature of the signal officer. The leader of the radio station will be orally informed to which unit the station will be assigned and in which area it will be employed. However, the radio section leader will not be told with which unit he is to establish connection.
9. In selecting a suitable position for his radio installation, the section leader's prime considerations are the technical conditions required for good radio communication; tactical requirements rank second. The first duty of the radio section, after arrival at the selected position, is to establish radio contact. After that, the position will have to be improved. Communication with the tactical commander in charge will be established by wire or messenger.
10. Together with the written order on radio procedure, the radio installation will be issued the following records:
- The radio log-book with consecutively numbered pages, which are secured in place by a sealed cord. The entire radio traffic conducted by the station will have to be entered with the exact time data. Radio messages are entered only with their headings, communications relating to the conduct of operations in their full text.
 - The log-book for radio messages received.

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- c. The logbook for radio messages transmitted. The latter two logbooks are arranged in the same way as the radio logbook mentioned under 'a' above.
- d. Pads with 100 numbered sheets for the transmission of radio messages. The disposal of each single sheet must be accounted for.
- e. In some cases also a battery record book.

Radio Traffic.

11. In the conduct of radio traffic, a distinction is made between:

- a. A continuous connection, in which the receiving station must be ready for reception at any time.
- b. A periodic connection, in which radio stations conduct operations at pre-arranged periods, generally at intervals of 60 or 30 minutes. regular military radio installations had to contact their **call station in the first** or twentieth minute of each hour.

Radio Silence.

12. Usually, radio silence is ordered only by the signal officer in charge. A distinction is made between two forms of radio silence:

- a. Radio silence on a stand-by basis. Radio silence may be broken in the event of an imminent enemy attack against the unit to which the radio station is assigned or in case of an attack against the radio station itself. Radio silence with receivers ready for reception is generally ordered when the troop unit concerned is in the defensive and radio communication is used only in emergency cases.
- b. Complete radio silence, which requires that receiving sets be switched off. Transmitting operations are resumed only by order of the headquarters which had ordered the radio silence. Complete radio silence is usually ordered prior to attacks until the beginning of artillery preparation.

Employment of Means of Signal Communication.

13. The following principles are followed for the employment of means of signal communication:

- a. Companies and batteries use the means of signal communication available to them primarily for the establishment of connections to outposts and forward observation posts.
- b. Battalions must establish connections to forward observation posts, to assigned units and to their right neighbor.
- c. Regiments must establish connections to their assigned units, right neighbor and rear echelons.
- d. Divisions must establish connections to their assigned units and to supply units. As a rule, the division headquarters is equipped with teletypewriters.

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Type Designation	Size and Weight	Wave Range	Output in Watts	Range in km.			Radio Receiver	Number of Tubes R - Receiver T - Transmitter
				with High Antenna A 1	with Loon Antenna A 3	with Loon Antenna A 1		
R/3	40 kg.	60 to 116 meters	5	18 to 20	8 to 10	8 to 10	3 to 5 Super	- 5 R: 4xHP212 tubes 1xLR5T tube T: 3 tubes
				in level terrain				
				in mountainous terrain				
				10 to 15	7 to 8	5 to 7	up to 3 two-way communica- tions	
R/20-1 and R/20	25x20x20 cm. 14 kg. with acces- series	60 to 116 meters (2 ranges)		in level terrain			two-way communica- tions	R/20 set: 1.5 V fila- ment type valves T and R; 2xLR5T, 2xLS4T; 4xLS5T and 1xDL1121 tubes
R/5B		60 to 116 meters	20	90 to 100	40 to 50			
A/5B and A/7B				3			for two-way voice radio traffic	
R/7L		1.4 to 5 megacycles	20	90 to 150	40 to 50		Super	T: 1xOS1, 2xOS6/300 and 1x9CH3 tubes R: 9xDF23 tubes

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R/7B	with access- 2 to 220 series 250 meters kg (2 ranges)	20	T: as R/7L R: 2x3EL2 and 3x3CH3 tubes
R/14	650 kg	more than 100	
K/41	1.4 to 10 megacycles	=	Super - 8 5 tubes

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